

berries are dropped into a pan by the picker's side. When the pan becomes full it is emptied into a pail holding one-third of a bushel, the contents of these pails, in turn, being placed in crates. The crates are taken to the storehouse, where the berries are put through a winnowing machine, which removes the dirt and leaves gathered during the harvesting. Following this they are crated or barreled, and made ready to ship to market.

The pickers average from seven to twenty pails a day, the number being regulated by individual skill. The average price paid is twelve cents a pail. A picker may be of almost any age, and it is no unusual sight to see whole families at work in the bogs during the comparatively short season of picking. Unlike the hop and grape gatherers, the pickers are generally farmer folk of the neighborhood, who take this method of adding to the year's income.

Coincident with the opening of the picking season, early in September, the new crop of berries begins to appear in the market. Few people, dealers say, are able to distinguish the old from the new. The newcomers are worth about five dollars a barrel to the producer, but by the time they have reached the consumer the price is likely to be ten cents a quart, although, if the supply is very plenty, the price is occasionally not more than five cents a quart.

These pioneer berries come from the greatest of cranberry-producing sections, Cape Cod. It is here that cranberry cultivation was inaugurated at the beginning of the last century.

Cape Cod furnishes a large proportion of the best berries, and about two-thirds the total crop of New England. Next in volume of productiveness comes New Jersey, whose product this year is placed at 300,000 bushels. Part of the Jersey crop is made up of wild cranberries. These are sometimes picked before they have begun to color, then spread on the ground, and exposed to the sun for six weeks; it is claimed that in this way a deeper color is secured.

Following New Jersey come New York State berries, most of which are grown on Long Island. These, on the whole, are particularly good berries, large in size, and for that reason attractive. The cranberry is the one fruit whose quality is held second to its appearance.

There are cranberry bogs in Wisconsin, Michigan, Minnesota, and northern Ohio, and the times of harvesting and marketing are about the same as in the East. The western berry seldom finds its way east, for the home demand is as great as the supply. For this reason the eastern berry often finds its way well toward, and sometimes beyond the Mississippi. Generally it is of better quality, for the proportion of western berries gathered from wild vines is large.

Every year small consignments of cranberries are shipped to Europe, and statistics show a slight but steady increase of exportations. It is only natural that this increase should occur, because the American cranberry is ineffably superior to the European. England receives most of its cranberries from Norway and Sweden, but they are not nearly so good as the American product. Perhaps poor quality has caused the cranberry to lack in popularity abroad. Certain it is that nowhere is this berry as popular as in the United States, where a larger quantity is consumed than elsewhere.

**THREE-PHASE 10,000-VOLT RAILWAY AT GROSS-LICHTERFELDE.**

BY FRANK C. PERKINS.

The electric locomotive used on the experimental Gross-Lichterfelde high-potential electric railway was designed and constructed by Siemens & Halske, of Berlin. The three-phase current locomotive is seen in the accompanying illustration. The door at the side bears the warning, "Danger. High-Tension Current, 10,000 volts." The locomotive is constructed of steel and mounted on heavy trucks. The brakes are oper-

The line at Gross-Lichterfelde was built by the firm of Siemens & Halske for the purpose of studying the best means of applying three-phase current of high potential to traction purposes, and the results have been extremely interesting. Many difficult problems arose which have each in its turn been solved. The speeds attained are unfortunately limited by the shortness of the line.

Magnetic blowouts are used for the contacts of the controllers, and the resistance switches are operated in the transformer chamber from the controller by means of chains and chain wheels. The rheostats are mounted underneath the locomotive floor, and as the potential which enters the locomotive from the trolley wires is of 10,000 volts, all of the metal work of the locomotive is very carefully grounded to avoid danger to life.

In order to operate the locomotive motors at the low potential of 750 volts, two step-down transformers are installed on the locomotive, as in the case of the Berlin-Zossen road, which was described in the SCIENTIFIC AMERICAN. Many of the devices adopted for the Berlin-Zossen high-speed road were the result of experience gained in this Gross-Lichterfelde experiment. The switch for breaking the 10,000-volt circuit is of the Siemens & Halske high-tension special tube form, a distance of one foot separating the breaking points when the switch is open. These high-tension switches are arranged on the roof of the locomotive, and all of the connections are carefully insulated with porcelain. The three vertical supports on the top of the car each have mounted upon them a bow-shaped aluminium trolley pole or current collector, heavy springs being provided to press the same against the trolley conductors, three of which are suspended one above the other something over a yard apart. The poles with the aluminium bows, which are constructed of this metal for reducing weight as far as possible, are controlled from the cab by the motorman and may be released from the overhead conductors at will. There are three lightning arresters mounted on the top of the locomotive, of the Siemens & Halske horn-shaped type.

The overhead trolley line consists of three conductors mounted on or suspended with insulators and chain from bow-shaped brackets similar to those used on the Berlin-Zossen high-potential line. It will be noted from the accompanying illustration that loops are also used at the supporting insulators, which are intended to ground any of the conductors breaking and falling to the ground. The trolley wires are flexibly suspended, the lowest of the three wires being about 20 feet above the track, and a wire netting is plainly seen in view for guarding against dropping of broken conductors. The overhead line is supplied by a three-phase current at 10,000 volts and a frequency of 50 cycles per second, from a substation equipped with static step-up transformers and motor generators. This road is of particular interest as being one of the pioneer roads using polyphase alternating currents and introducing high potential directly into the moving vehicles.

The closing of several London theaters on account of the recent fog is not an unprecedented event of British theatrical history, though this last occurrence had an unusual element, due to the fact that the players engaged at these theaters were unable to reach them.

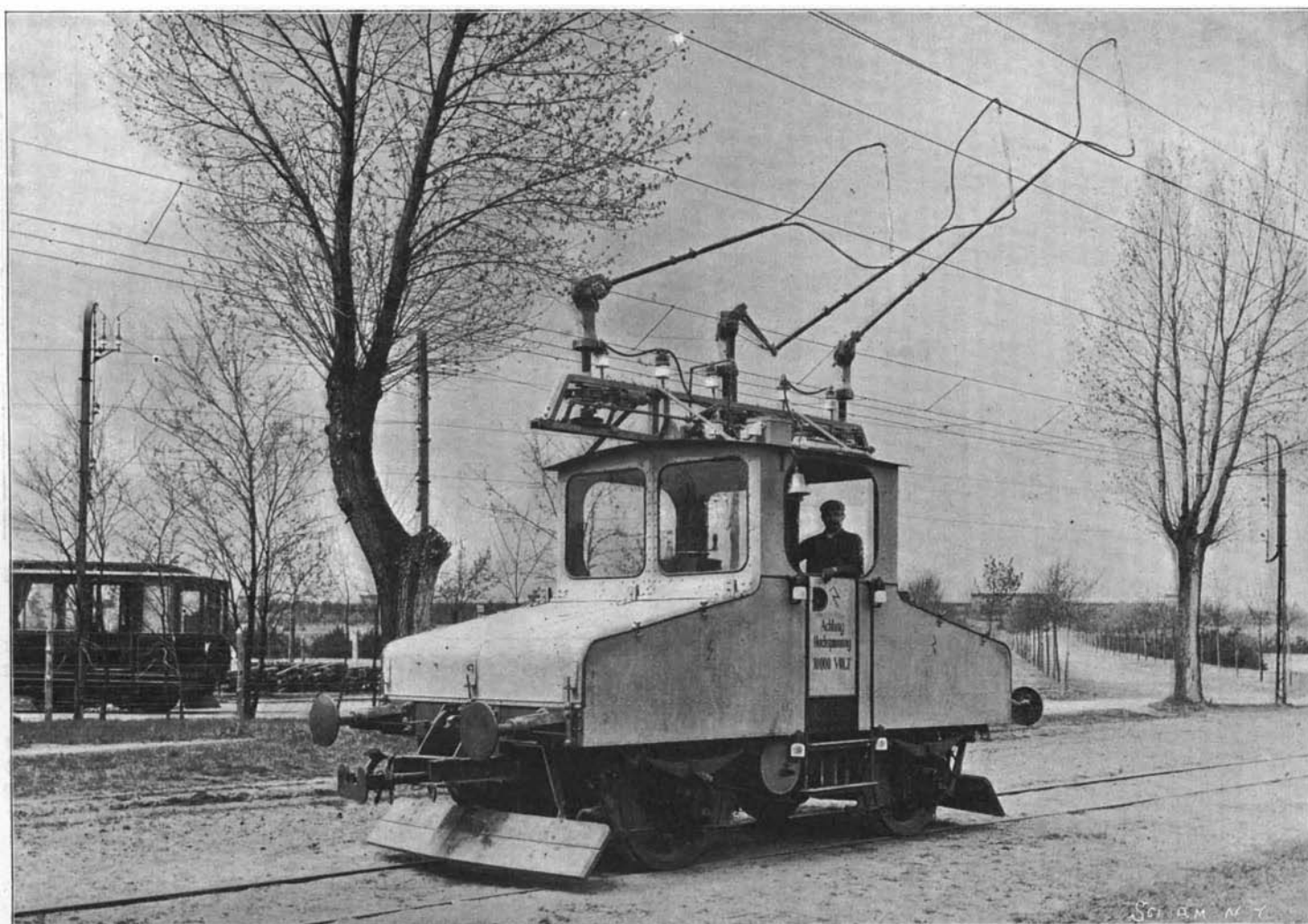


A FLOODED CRANBERRY MARSH.

ated by hand as well as compressed air. The air-pressure is secured by an electrically-operated compressor.

The main driving motors of this locomotive are of the asynchronous three-phase type and operate at a potential of 750 volts. The capacity of the motors is from 60 to 240 horse power at normal and maximum load. The speed of the locomotive is 60 kilometers per hour, the ratio of gearing being 1:3.15. If the line were long enough and the track of the right construction, it is stated that the locomotive could easily attain a speed of 125 kilometers per hour. The voltage required at this speed would be 2,000 volts at the terminals of the motors. The controller in the cab regulates the speed by arranging the motor winding in "mesh connection" for maximum pull; and for normal running at high speed, the voltage when connected in "mesh" would be 1,150 volts.

The locomotive has a total length of frame of 4 meters and a width of frame of 2.2 meters, the gage of track being 1.435 meters. The total weight of the outfit is 32,000 pounds. The distance between the axles is 2.8 meters, the diameter of the wheels is just one meter.



A SIEMENS-HALSKE THREE-PHASE HIGH-POTENTIAL ELECTRIC LOCOMOTIVE.